Grade 5

Math Curriculum

Content and Resources

**Little Rock School District**

**Curriculum Map**

**5th Grade**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Unit 1 | Unit 2 | Unit 3 | Unit 4 | Unit 5 | Unit 6 | Unit 7 | Unit 8 |
| Order of Operations and Whole Numbers  **8/20-10/12**  **42 days** | Understanding Decimals  **10/15-10/26**  **15 days** | Operations with Decimals  **10/29-12/5**  **20 days** | Geometry and the Coordinate Plane  **12/6-12/21**  **12 days** | Adding, Subtracting, Multiplying and Dividing **Fractions**  **1/9-3/8**  **40 days** | 2D Figures  **3/11-3/15**  **5 days** | Volume and Measurement  **3/25-4/26**  **19 days** | Gap Lessons  Prepare for 6th grade  **4/29-6/5**  **28 days** |
|  | SOAR Dates  October 17-18 |  | SOAR Dates  December 12-13 | SOAR Dates  February 27-28 |  | ACTAAP 4/8-4/12 |  |
| 5.OA.1  5.OA.2  5.NBT.2  5.NBT.5  5.NBT.6 | 5.NBT.1  5.NBT.3  5.NBT.4 | 5.NBT.2  5.NBT.7 | 5.G.1  5.G.2  5.OA.3 | 5.NF.1  5.NF.2  5.NF.3  5.NF.4  5.NF.5  5.NF.6  5.NF.7  5.MD.2 | 5.G.3  5.G.4 | 5.MD.1  5.MD.2  5.MD.3  5.MD.4  5.MD.5 | ALL |
| These units will be written to build upon concepts from prior units, so later units contain tasks that depend upon the concepts addressed in earlier units  ALL UNITS WILL INCLUDE THE MATHEMATICAL PRACTICE STANDARDS AS THESE ARE THE BASIC SKILLS FOR OUR STUDENTS TO SUCCEED!  These will be interwoven and should be addressed throughout the year in as many different units and tasks as possible in order to stress the natural connections that exist among mathematical topics. | | | | | | | |

**ALL UNITS WILL INCLUDE THE MATHEMATICAL PRACTICE STANDARDS AS THESE ARE THE BASIC SKILLS FOR OUR STUDENTS TO SUCCEED!**

**The practice standards will be interwoven and should be addressed throughout the year in as many different units and tasks as possible in order to stress the natural connections that exist among mathematical topics.**

**Highlighted standards are focus standards.**

Unit 2

Content Standards, Rationale, Strategies, Essential Questions

**5.NBT.1 (You may want to reference Rationale in Unit 1)**

Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and   
of what it represents in the place to its left.

**5.NBT.3**

Read, write, and compare decimals to thousandths.

1. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 x 100 + 4 x 10 + 7 x 1 + 3 x () + 9 x () + 2 x ().
2. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

**5.NBT.4**

Use place value understanding to round decimals to any place.

**Rationale**

**Base-ten units**

Each place of a base-ten numeral represents a base-ten unit: one, tens, tenths, hundreds, hundredths, etc. The digit in each place represents 0 – 9 of those units. Because ten “like” units make a unit of the next highest value, only ten digits are needed to represent any quantity in base ten. The basic unit is a *one (*represented by the rightmost place for whole numbers). In learning about whole numbers, children learn that ten ones compose a new kind of unit called a ten…..In learning about decimals, children partition a one into 10 equal-sized smaller units, each of which is a tenth. For example, one hundred can be viewed as a tenth of a thousand, 10 tens, 100 ones or 1000 tenths.

In Grade 5, students extend their understanding of the base-ten system to decimals to the thousandths place, building on their Grade 4 work with tenths and hundredths. Students will extend their understanding by again observing the relationship between adjacent places except now it will include decimals. They will make the connection that “it works the same way” as with whole numbers.

In Unit 2, students continue to build upon their knowledge from unit 1 in these ways:

1. Whole number exponents denote powers of 10 and the pattern of multiplying by a power of 10 works the same way for numbers with decimals (tenths, hundredths, and thousandths) as it does with whole numbers; ex. 25 x 10 = 250 ; 25 ten times is 250; .25 x 10 = 2.5; 25 hundredths ten times is 2.5
2. Multiplying by a power of 10 shifts the digits of a whole number or decimal number (rational number) that many place to the left. (see example above)
3. Patterns in the number of 0s in products of whole numbers and powers of 10 and the location of the decimal point in products of decimals with powers of 10 can be explained in terms of place value.

In 4th grade, students developed their understandings of decimals and computations with decimals in terms of multiples rather than powers; in 5th grade connecting the terminology of “multiples” with that of “powers” affords connections between understanding of multiplication and exponentiation.

250 is a multiple of 25. It is the tenth multiple of 25. This is the same as multiplying 25 by a power of 10.

**Strategies**

In Grade 5, the concept of place value is extended to include decimal values to thousandths. The strategies for Grades 3 and 4 should be drawn upon and extended for whole numbers and decimal numbers. For example, students need to continue to represent, write and state the value of numbers including decimal numbers. They need to continue to compose and decompose decimal numbers as well as compare them. (*For students who are not able to read, write and represent multi-digit whole numbers, working with decimals will be challenging. Specific Intervention)*

Number cards, number cubes, spinners and other manipulatives can be used to generate decimal numbers. For example, a game can be played in which students roll three number cubes. They create the largest and smallest number to the thousandths place. Different challenges for “winning” can be created, i.e. 4 rounds of play – lowest total wins or highest total wins once all four numbers are combined. Make sure students are able to explain the concept or strategy for winning. Students should have practice writing the number with both numerals and words.

Use the “number talk” portion of your instruction to compare and estimate decimal numbers. Look at the structure.

Use unit number discs to understand the pattern of multiplying by a power of 10.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Tens | Ones | Tenths | Hundredths | Thousandths  0.011 |
|  | 10 x .1 = 1  Or  1 = ten tenths  1.0 | 0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1  0.1 |  | 0.0011  0.1 |

Start with the number 1 and multiply by a power of 10, then multiply 10 x 0.1, then .01 x 10. What happens when you multiply ten times the amount for each place? What happens to the decimal? What happens to the number? Compare the result to either place left or right. How does that compare to multiplying 10 x .1 or 10 x .01? What is happening? Use on the SMARTboard with the cloning tool to make unlimited discs. Write the numbers under each other to observe a pattern. What do you notice? Ask: Will this happen every time? Continue to extend their reasoning to multipliers that are single-digit multiples of .2 and .02, etc.

10.0

1.0

**Common Misconceptions**

* The longer the number the greater the number

With whole numbers, a 5-digit number is always greater than a 1-, 2-, 3-, or 4-digit number. However, with decimals a number with one decimal place may be greater than a number with two or three decimal places. For example, 0.5 is greater than 0.12, 0.009 or 0.499. One method for comparing decimals it to make all number have the same number of digits to the right of the decimal point by adding zeros to the number, such as 0.500, 0.120, 0.009 and 0.499. A second method is to use a place-value chart to place the numerals for comparison.

* Putting a zero at the end of a decimal number makes it ten times as large
* Decimal fractions are “below zero,” or negative numbers
* Place value columns include “oneths” to the right of the decimal point
* One-hundredth is written 0.100
* One-fourth can be written either as 0.4 or as 0.25

Unit 2

**Investigative Tasks ∙ Games ∙ Problem-solving**

Lesson 1

**Decimal problem-types – powers of 10**

Focus on structure and what is happening with the number when dividing by a power of 10. Students must explain and justify.

* Ms. Gomez has 359 dollars. She wants to use this money to buy teddy bears for the children’s hospital. If each teddy bear costs 10 dollars, how many teddy bears could she buy? (258, 10) (1263, 100)
* The pencil factory makes 3,875 pencils a day. They put the pencils into boxes with 10 pencils in each box. How many boxes of pencils do they make in one day? (3,875, 100) (10,500, 100)

Lesson 2

**Representing decimal numbers and patterns.**

Written symbols and numbers need to be corresponded to the models. Relate to whole number system and fractions for tenths and hundredths. Discover the symmetry of the system by looking at adjacent places.

[Representing Decimals with Base 10 Blocks, pp. 1-8](http://www.lrsd.org/files/edservices/5xmRepresentingDecimalswithBase10Blocks.pdf)

(example of graphic organizer to use)<http://www.k-5mathteachingresources.com/support-files/representingdecimalswithbase105.nbt3.pdf>

Lesson 3

**Decimal problem-types – powers of 10**

Focus on structure and what is happening with the number when dividing by a power of 10. Students must explain and justify based on strategies they create. Analyze the similarities and differences with whole number operations. Make connections between their understanding of fraction notation for tenths and hundredths and the decimal notation. What is happening to the decimal?

* An animal at the zoo eats \_\_\_\_\_\_ pounds of food each day. How many days will it take this animal to eat \_\_\_\_\_ pounds of food?

(10, 78) (10, 374) ( , 6) ( , 56) ( , ) ( , )

Lesson 4

**Decimals and decimal notations**

More opportunity for students to think about decimals and decimal notation in a problem-solving, gaming format.

[Decimal Riddles, pp. 21-26](http://www.lrsd.org/files/edservices/5xmDecimalRiddles.pdf)

Lesson 5

**Decimal problem-types – powers of 10**

Focus on structure and what is happening with the number when dividing by a power of 10. Students must explain and justify. What is happening to the decimal? Will this happen every time?

* Julie has six huge candy bars. If she eats candy bar each day, how long will these six huge candy bars last?

(12) ( , 24)

* The bakery has 58 pounds of frosting. It takes pound of frosting to frost a cupcake. How many cupcakes could the bakery frost with the frosting they have?

Lesson 6

**More Practice with composing and decomposing decimal numbers; place value**

Revisit [Decimal Riddles, pp. 21-26](http://www.lrsd.org/files/edservices/5xmDecimalRiddles.pdf)

Lesson 7

**Open Number Sentences**

Focus is on justifying what occurs with powers of 10. Students should reason using fractions, manipulatives, etc. They must explain how they know. Example for “a”: “I know that 10 tenths is 1, so *k* = 10”

Directions: Ask students to work the problems in order. Have base 10 available for those who need it. Have students pair-up to discuss their strategies. Listen for students using relational thinking. Ask student pairs to share their strategies with the whole class.

1. *k* **x** 0.1 = 1
2. *m* **x** 0.1 = 3
3. *j* **x** 0.1 = 30
4. y **x** 0.1 = 300
5. r **x** 0.01 = 3
6. j **x** 0.01 = 30
7. s **x** .01 = 300
8. r **x** 0.01 = 43
9. a **x** 0.01 = 43

Lesson 8

**Practice for reading, writing, and interpreting decimal numbers. Two games are introduced. Pull back small groups for students who need more support.**

**The Place Value Game**

You need: a partner or small group, a die, or 0-9 spinner, or number cards 1-9

The goal of this game is to make the largest number possible. Each player writes it in one space on his or her game board.

\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_ . \_\_\_\_\_ \_\_\_\_\_

Players take turns rolling the die, spinning the spinner, or choosing a number card. Each time a number comes up, every player writes it in one space on his or her game board. Once written, the number cannot be moved. The winner has to have the largest or smallest number (depending on what you decide) and must be able to read it.

*Extension:* Both partners need to write the number in expanded form and figure the difference.

*AND*

**Decimal game** (game board included) <http://www.k-5mathteachingresources.com/support-files/huntfordecimals5.nbt3.pdf>

Lesson 9

**Decimal problem-types – powers of 10**

Focus on structure and what is happening with the number when dividing by a power of 10. Students must explain and justify. What is happening to the decimal? Will this happen every time?

* Mrs. Jones has 237 dollars. She wants to use this money to buy books to donate to the children’s hospital. If each book costs 10 dollars, how many books could he buy?

(523, 10) (25, 0.10 ….change the books to used comic books and change the person to a student) (110, 0.10)

* Henry uses 1/10package of cinnamon in each batch of cinnamon cookies he makes. If Henry has 3 and 1/10packages of cinnamon, how many batches of cookies can he make? (make sure to relate the fractions to decimal notation.

Lesson 10

Practice with equations and powers of 10. Ask students to find at least 3 solutions to each problem, more if possible.

1. *a*  x 10 + *b* = 53
2. 832 = *a x 100 + b x 10 + g*
3. 874 = *b*  x 10 + c
4. 874 = *c*  x 100 + *b* x 10

Lesson 11

**Assessment**

Students take 10 question interim assessment. Implement using the workshop model. Students work individually. Grade assessment the same day, in class, to give immediate feedback. Students justify and defend their solutions.

**Closure Structures**

Encourages Practice Standards 1, 2, and 6 (communication; sharing of ideas; precise language)

1. Have students share out strategies strategically to the class; class critiques the reasoning and determine if they agree or disagree. Students practice explaining the strategies of others. Strategies are compared and discussed by students.
2. Gallery walk – student solutions are posted around the room. Small student groups rotate around the posters to see if they can make sense of the solution presented. Stickie notes are used by students to ask questions or to ask questions or to make specific comments or suggestions on the strategy presented.
3. Round Robin – students pass their solutions to other tables. Student pairs critique the reasoning of the student work. Like in gallery walk, stickie notes are used by students to ask questions or to make specific comments or suggestions on the stategy presented.

**Journal**

Having students process thinking at the end of a session helps them determine what they understand and don’t understand; also is a formative assessment for the teacher. Journal prompts should also address key concepts of the math to be learned.

Sample Prompts

* Write three good questions you could ask to learn more about the topic we studied today. I wonder……
* You have three minutes to write everything you learned today. Don’t worry about the organization – just write for three minutes about what you learned.
* Write two test questions that you think the teacher might put on the test. Make your questions about the most important ideas of the unit.
* Today I learned:
  + This connects to what I know about:
  + What I learned today can help me later when: